STATE OF COLORADO

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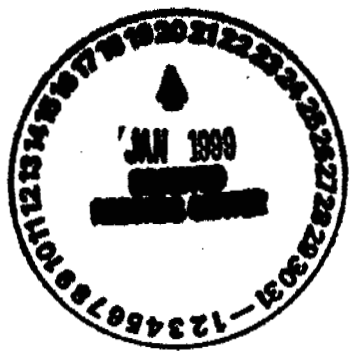

Gary Kleeman
Rocky Flats Team
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Region VIII
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Dear Gary:

RE: CDPHE Comments on the Draft Conceptual Remediation Design East Trenches Plume Project

ALF and RFCA provide latitude in determining the need for remediation of contaminated ground water plumes. The plume management strategy outlined in the IMP provides a step-by-step approach which leads to the remedial design phase. In contrast, the approach in this document is presumptive and bypasses several important steps in the IMP evaluation process. In particular this evaluation of impact lacked formal definition of DQO's which lead to the following deficiencies in decision making information:

1) Definition of the source concentrations and estimates of travel time to the stream and lifetime of the plume. This information should be available from the OU2 characterization work, even a simple model in the Solute group of codes includes adsorption which would give reasonable estimates.

2) The plume flux estimate alone is not the measure of the impact to surface water. Natural attenuation from volatilization through surface water is certainly an operational process in this drainage.

3) No investigation was conducted to determine the extent of the plume in the stream alluvium. This information is critical to the evaluation of whether natural attenuation can take care of the plume. Information was provided to RMRS before the field investigation on a less invasive method for determining organics in stream sediments.

4) No confirmatory sampling was done to determine if the surface water exceedances were present outside of the ice cover circumstance.

The Draft Conceptual Design document seems to be mostly an alternatives analysis done with the presumption a barrier is necessary. The following points outline the logic of our reluctance to proceed with this project without further evaluation.

1) The interpretation of impact to surface water is a demonstrated or modeled exceedance of surface water action levels in the stream anywhere in the water column, consistent with Water Quality Control Division and general hydrologic practice. The surface water samples exceeding action levels are not in violation of RFCA since they were not collected at a POE or POC. It is the possibility of future exceedances of surface water standards in the water column after active cleanup that must be prevented.

2) EPA policy on Monitored Natural Attenuation (MNA) seeks reduction of the mass of contaminant within a reasonable time frame. Volatilization is a physical process included in this directive. The unique circumstance of each plume must be evaluated for each application of MNA. The recent EPA seminar on this subject provided many case studies and examples for evaluation of dehalogenation and biodegradation, but none specifically for volatilization. The major aspects of evaluating a plume for evidence of natural attenuation are similar no matter which process is operational. They involve knowledge of the plume source, concentration, pathway, and flux. A plume must be shown to be stable, that the attenuation process is removing contaminant at the rate it is being transported so that the plume is not expanding to a receptor.

3) An example of the Thin Film Model of volatilization of organics from surface water (page 79, Hemond and Fechner, 1994) allows calculation of the surface area necessary to volatilize 13 g/day of TCE. Only 100 square feet of surface water is necessary.

4) The calculation of ground water flux to the stream and/or alluvium is not the full calculation of whether there is impact to surface water. The mass balance of water in the stream system includes all water in the system, groundwater inflows, alluvial flow, and surface water flow. This analysis is complicated by the transient nature of the stream; full connection between the surface and the alluvium is lost when the surface flow is zero. Volatilization of contaminants to the atmosphere from the subsurface is possible to about 3 feet below ground surface. A case by case evaluation must consider the geometry of the stream system and surface water flow.

5) RFCA and ALF allow designation of new Tier II wells if those "wells are shown to be contaminated or if additional plume information dictates" (ALF 3.2.B.4.c). Contaminant concentrations were found in the new Tier II well 23296. We must evaluate how far

down the drainage this plume is likely to go. For RFCA we made the assumption that all contaminated ground water became surface water. We must verify this assumption for each plume under evaluation.

6) If the ground water will impact surface water quality (exceedance of action levels in the water column), then we must evaluate remedial actions that would mitigate the impact; then select the appropriate remedial action. This analysis gives us performance goals for the remedial action.

7) What is the implication to this plume evaluation of the statement in the RFCA preamble B.3.b."Groundwater quality in the Outer Buffer Zone and off-site will support all uses"? Our interpretation is that prior to the Buffer Zone ROD, we must demonstrate that groundwater flow from the inner BZ does not impact outer BZ water quality (defined as limiting unrestricted use). The current condition of the terminal pond dams should provide an impermeable barrier to migration of contaminants into the outer buffer zone area. What changes will future surface water management of these drainages have on residual ground water plumes?

Because MNA was not considered as an alternative for this plume remediation, data needed for full consideration of it were not collected. Therefore the current design proposal cannot be compared in terms of cost and protectiveness. A safe time frame exists before any surface water violations will occur in which to make a well considered decision about the necessity of this and any other ground water remediation system. A study designed with appropriately defined DQO's will be more cost effective in the long run.

There has been no document to present the evaluation of impact to surface water for comment prior to this draft conceptual remediation design. Some of the available details critical for decision making have not been included in this document. None of the results of surface water sampling conducted as part of this investigation, nor historical hits were included. Information on adverse impact to mouse and aquatic habitat from the contamination is not provided. The location of mouse habitat and the impact to that habitat of volatilizing organics through soils and surface water should be included.

The explanation and presentation of the ground water flow and contaminant pathway conceptual model is weak. It is difficult to tell from this document that most transport is in the bedrock sandstone. The new sandstone information from the geoprobe investigation needs to be used to update the sandstone maps and cross sections in the geologic characterization report and they should be presented as part of the conceptual model for this plume.

The maximum contaminant concentration does not occur in the areas of highest flow. These pathways should be re-evaluated. It is questionable if hydraulic conductivity values from OU2

pump tests are appropriate to use for flux estimates in the sandstone because of the differences in grain size between the edge of the channel location and the pump test location. This may explain why the highest flow zone of the proposed collection system does not coincide with the area of greatest contaminant concentration. This is particularly apparent in the estimation of iron needed at each gate (Appendix D, Table 2). The one cubic foot estimated for Gate 3 needs a reality check.

The operation and maintenance requirements of the proposed treatment system should be detailed. The location of the treatment system and discharge or of gate locations have not been evaluated for changes to the drainage flow system. What is the relative importance of ground water discharge to the stream on mouse habitat?

A significant flux of contaminants to the drainage is suggested on page 3-1 but no quantification of the up gradient concentrations to determine the lifetime of the plume is presented. This information is essential to the remedial design and long-term operating requirements.

Several other factors should be considered before a decision to install a remediation system. Evaluation of adverse impacts to ecology from the proposed remediation project are not considered. What is the impact of construction in the mouse habitat? What are the slope stability issues for this project? If slumping occurs on this project will the hillside be recontoured to unload the open ditch? What are future decisions for the water that is now piped around this area?

RFCA, ALF and the IMP were designed to give us the freedom to make a scientific evaluation of the need for remediation. We are not opposed to installation of this system if a full evaluation shows it to be a good alternative but we do not think that has been demonstrated at this time. Should you have questions on the issues raised please contact me at 303-692-3429 or Carl Spreng, 303-692-3358.

Sincerely,

Elizabeth

Elizabeth T. Pottorff
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Rocky Flats Oversight Unit

att: References

cc: Tim Rehder, EPA
Bob April, DOE
Chris Dayton, KH
Steve Singer, RMRS
Annette Primrose, RMRS

References cited:

Office of Solid Waste and Emergency Response, 1997, Policy Directive: Use of Monitored Natural Attenuation at Superfund, RCRA corrective action, and Underground Storage Tank Sites, Directive 9200.4-17.

EPA Seminar, 1998, Monitored Natural Attenuation for Ground Water, Denver, September 14-15.

Hemond, H.F. and Fechner, E.J., 1994, Contaminant Fate and Transport in the Environment, Academic Press, San Diego, CA